TDT4171 ASSIGNMENT 5

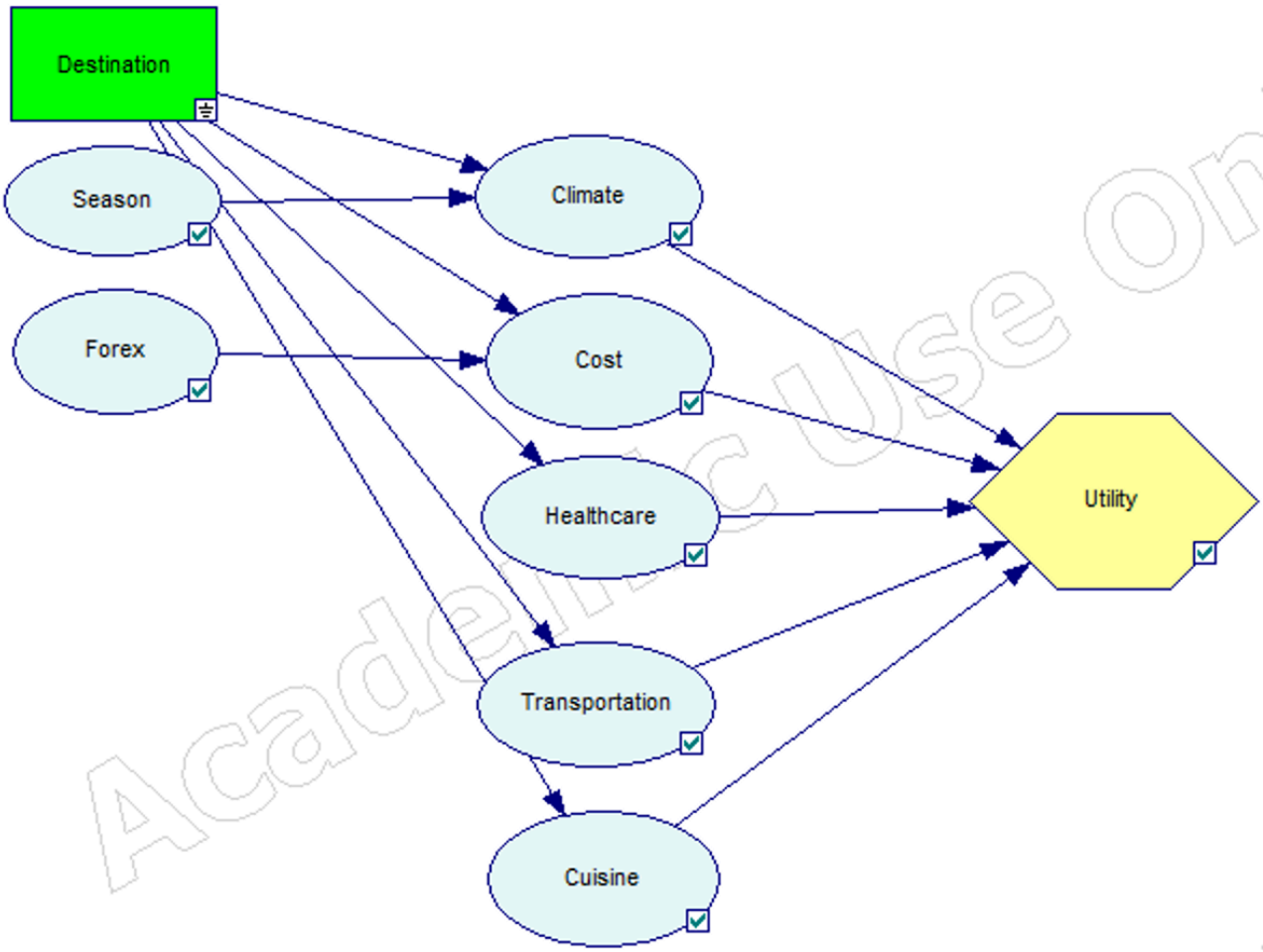
Model

Structure

The decision problem I decided to model is a travel destination decision system. The destinations we have to choose from is America, Asia and Africa. The variables directly or indirectly affecting the utility are:

Season, Forex, Climate, Cost, Healthcare, Transportation and Cuisine.

The arrows represent which variables affect which variables. For example; Destination and Season affect the climate, which again affects the utility.



Probability tables

The climate probability table:

Season	Spring			Summer			Autumn			Winter		
Destination	Asia	America	Africa	Asia	America	Africa	Asia	America	Africa	Asia	America	Africa
Varm	0.75	0.75	0.9	0.9	0.9	0.9	0.75	0.75	0.9	0.25	0.25	0.5
Cold	0.25	0.25	0.1	0.1	0.1	0.1	0.25	0.25	0.1	0.75	0.75	0.5

The cost probability table:

Forex	Good			Bad		
Destination	Asia	America	Africa	Asia	America	Africa
Low	0.4	0.2	0.7	0.2	0.1	0.4
Moderate	0.35	0.6	0.2	0.4	0.4	0.4
High	0.25	0.2	0.1	0.4	0.5	0.2

Probabilities are calculated based on common knowledge about the destinations, and are not 100% correct. They are only there to represent differences. These probabilities could be more accurate if the destinations to choose from were more specific, or we had gathered more data about the destinations.

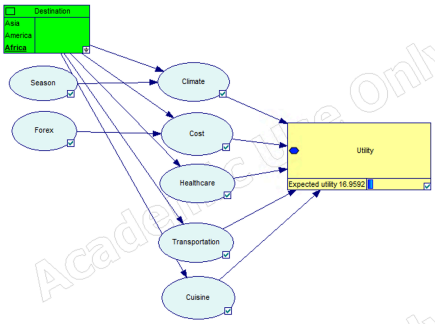
Utility function

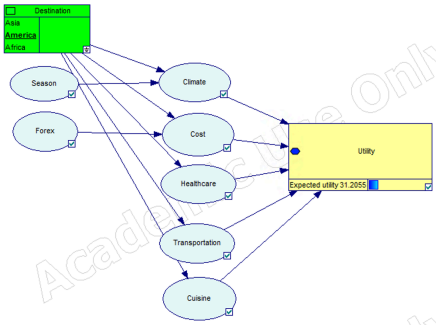
The utility function:

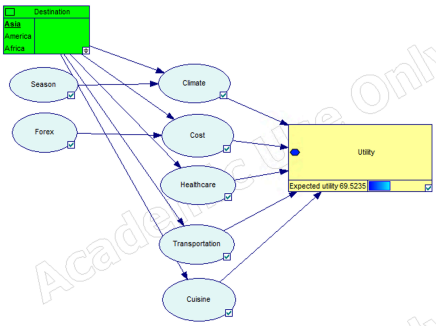
Climate	Varm												Moderate								
Cost	Low																				
Healthcare	Decent						Poor						Decent								
Transportation	Decent			Poor			Decent			Poor			Decent			Poor					
Cuisine	Diverse	Neutral	Bad	Diverse	Neutral	Bad	Diverse	Neutral	Bad	Diverse	Neutral	Bad	Diverse	Neutral	Bad	Diverse	Neutral	Bad	Diverse		
Value	200	40	10	100	30	8	100	50	5	20	10	2	100	20	5	50	15	4	50		

This is only a snippet of the entire function. But what is done here is quantification of the different states. For example if it is warm, the cost is low, healthcare is decent, transportation is decent and the cuisine is diverse, then the utility is 200. On the other hand, with poor transportation, healthcare and cuisine, the utility is 4. These numbers are set by me to quantify how much each of the states is appreciated (utility).

With this setup the different decisions give the following expected utility:







Assumptions

The arrows in the models suggest which variables I assume to be independent and not. For example I assume that wether the forex is good or bad is not affected by the destination. This is partly inaccurate because how much the travelers money is worth at the destination does not only depend on how «strong» the traveler money is. It also depend on the destination.

Another assumption is that transportation and season and climate/season is conditional independent. This is also a not true assumption as transportation services are usually affected by the time of year.